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TWENTY YEARS OF THE WORK OF THE STATE SCIENTIFIC CONTROL INSTITUTE FOR VETERINARY PREPARATIONS

Professor Ya. R. Kovalenko

In January 1951 the State Scientific Control Institute for Veterinary Preparations of the Ministry of Agriculture, USSR, completed twenty years of existence.

The State Scientific Control Institute was created in January 1931, in a period of profound change in the countryside.

On the basis of the complete collectivization in the Soviet Union, together with the massive development of sovkhozes and kolkhozes, animal husbandry forged ahead rapidly.

Various biological preparations have been used for present-day diagnosis, prophylaxis, and therapy of many infectious diseases in animals; however, there has not been a sufficient quantity of these preparations, and their quality has not always been satisfactory. Biological preparations have been manufactured by the production sections of several veterinary-bacteriological institutes. Each of these kept to its own manufacturing methods, and did not even consider serial production. With the mass use of inoculation agents, complications and the death of inoculated animals were observed as a result of the poor quality and low standards of individual production lines.

In 1930 steps were taken to organize and construct new production centers - the biologicals factories and combines. With the organization of these enterprises, the technological principles for producing inoculation agents were changed, and the

possibility of mass producing them presented itself. A new branch of veterinary medicine was created, the biologicals industry, producing vaccines, serums, and diagnostic agents. Scientific consultations showed it to be necessary to construct production establishments, an organization, and technological production processes, and to work out individual methods and standards for the production of inoculation agents by means of which it would be possible to produce preparations of high quality in any production center.

All of this served as the foundation for the organization of the State Scientific Control Institute for Veterinary Preparations. The Institute was charged with the state control of the preparation and use of all inoculation agents produced for mass inoculation, with supporting, checking on, and strengthening the production establishment for strains, matrices, and viruses used as the starting material for the production of the corresponding preparations, and with working out individual standards and methods of producing, checking and using biological preparations for veterinary purposes. The duties of the Institute also included checking on the scientific work leading to the development of new inoculation preparations, and with improving existing methods of using them and developing still better methods.

The first years of the work of the Institute succeeded in establishing instructions and methods for preparing, controlling, and using the biological preparations which existed at that time.

In addition to the workers of the Institute, the scientific workers and professors of many scientific research establishments took an active part in setting up these instructions.

In the beginning, while the mass production of preparations in biologicals factories was being organized, the forces of the Institute were directed toward making a selective control; in this up to 20 percent of the preparations were controlled after they had been released by the production establishments. This selective control, and the controls which followed it, were unable to prevent the release of poor quality preparations: among the animals which were inoculated there were some complications and deaths, while some series of preparations were ineffective.

In 1933 this control was reorganized, and biological preparations began to be controlled before their release into the veterinary network.

For this purpose branches of the State Scientific Control Institute were established at the large veterinary-bacteriological institutes in a number of republics and oblasts. These branches checked on all materials produced by the biologicals factories attached to the various institutes. After it was determined that the biological preparations were fit for use they were released for practical application. The quick release of finished products, however, was often made difficult because of the distance between the biologicals factories and their branches.

In 1934 the branches of the institute were replaced with control laboratories in all biologicals factories and production establishments; these exist up to the present day. The control laboratories are headed by state controllers, who are appointed by the Ministry of Agriculture, USSR, and who are subordinate to the State Scientific Control Institute in their particular specialty.

Beginning in 1936 all organizations producing bacteriological preparations for agricultural animals and fowl were obliged to register with the State Scientific Control Institute, and their production was to be subjected to a regular control check by the Institute. The Institute and its controllers have the right completely or partially to stop the production and release of unsatisfactory biological preparations.

As a result of the introduction of state control and of the increase in the capabilities of the controllers and of the production personnel, as well as of the improvement in equipment and production installations, the quality of the biological preparations produced began to rise sharply. Whereas in the first year of the existence of the Institute, 1931, rejects of finished products from the biologicals factories equalled 42 percent, and in 1934 had been reduced to 16.7 percent, this figure equalled 3.7 percent in 1945, only 2.9 percent in 1949, and by 1950, had been reduced to 2.4 percent.

The Institute performs regular work in caring for, supporting, and studying microbe cultures, viruses, and matrices, for the purpose of manufacturing and controlling biological preparations, and the Institute has at its disposal a large, well assorted collection of live microorganisms which are pathogenic for agricultural animals. Every year a number of basic production strains pass through the organisms of large animals, and, after being studied, these passed strains are multiplied in biologicals factories. All of these multiplied production strains are thoroughly studied for their antigenic, allergenic, and agglutinative properties.

Great work has been done by the Institute in the selection, testing, and understanding of matrices for Tsenkovskiy's vaccine; this work was performed by A. M. Dobroldhotov, Ye. M. Borisov, F. I. Kagan, S.G. Kolesov, and F. A. Terent'yev, work has also been done of Konev's swine erysipelas vaccine, by G. D. Glukhovtsev, N. D. Lebedev, N. I. Rozanov, P. S. Solomkin, and N. M. Nikoforova, which made it possible not only to save these matrices, but to improve them.

Each year the arsenal of active inoculation agents used in veterinary medicine grows.

Thanks to the general achievements of veterinary science, many new inoculation preparations have been made available. It suffices to point out that in 1918 a total of 13 immunobiological preparations were in use in veterinary medicine; by the beginning of 1931 this number rose to 26. In 1951 the number of these preparations had reached 72, including 31 vaccines, 18 immunization serums, and 23 diagnostic preparations. Nine chemico-therapeutic preparations have been developed; in addition, about 10 preparations are being widely tested in production.

Because of the highly effective biological preparations made available for veterinary practice, a number of scholars of the Soviet Union have received the great honor of winning the Stalin Prize. These include S. N. Muromtsev, N. V. Likhachev, M. M. Ivanov, A. A. Volkova, S. Ya. Lyubashenko, I. I. Kulesko, and N. N. Ginsburg.

As a result of the independent efforts to obtain new inoculation agents a number of valuable preparations have been made available by the Institute.

In 1936 the elder scientific collaborator of the Institute, V. F. Alekseyev, worked out a method for preparing a tissue vaccine for use against plague of large horned cattle, which proved very effective. In 1949 this vaccine was improved by Candidate of Veterinary Sciences P. N. Bazylev, and by the Chief Veterinary Doctor of the Biological Cabinet, S. I. Arziani. The perfection of this vaccine made it possible to reduce the dose by four or five times and to increase the period over which it can be used.

Professor N. V. Likhachev presented a method for preparing an aluminum hydroxide vaccine for use against sheep smallpox. Thanks to the use of this vaccine the occurence of sheep smallpox in the Soviet Union has dropped sharply, and in many regions has been completely liquidated. Candidate of Veterinary Science M. M. Ivanov prepared a vaccine for use against paratyphus of young pigs, which has found wide use on pig-raising farms. Both of these scholars received the honor of the Stalin Prize.

Candidate of Veterinary Sciences G. D. Glukhovtsev presented an aluminum hydroxide vaccine for use against swine erysipelas. This vaccine was widely tested on many pig-raising farms, and as of 1951 was accepted by the Veterinary Administration for practical use. Elder Scientific Collaborater A. V. Lyaushkin worked out a method for preparing a bivalent vaccine for use against bradsot and enterotoxemia in sheep. On farms where this product has been used losses of sheep have dropped by from 10 to 12 times. In 1951 the vaccine will be used as a mass prophylactic agent against bradsot and enterotoxemia.

For the last four years Candidate of Veterinary Sciences N. M. Nikoforova has worked on obtaining a vaccine for use against hemorrhagic septicemia of large horned cattle and sheep. During 1951 this vaccine will be tested under production conditions.

The collaborators of the Institute have also worked out new and more modern methods of obtaining vaccines and immunization serums.

Candidate of Veterinary Sciences A. G. Malyavin presented a method for obtaining a serum for use against paratyphus of young pigs by means of working up the animal producers in a formol culture. In recent years he has worked out a method for obtaining bivalent serums for use against colibacillosis and paratyphus of calves from one producer. These methods are being used by the biological factories for preparing paratyphus immunization serums.

Professor S. G. Kolesov worked out a new, accelerated method for obtaining a serum against malignant anthrax, by means of a precipitated vegetative culture of the malignant anthrax agent; he has also worked out a method for working up producers in sterilized culture of malignant anthrax.

Candidate of Veterinary Sciences N. M. Nikoforova and the Chief Doctor of the Biological Factory M. I. Anan'yev worked out a new method for obtaining a precipitating malignant anthrax serum in a formalinized culture of malignant anthrax. Candidate of Veterinary Sciences F. I. Kagan has perfected and introduced into practice methods for preparing a tetanus anatoxin and an anti-tetanus serum.

Candidate of Veterinary Sciences A. I. Shmulevich has worked on studying the effectiveness of new chemico-therapeutic agents, such as "novoplazmin", haemosporidin, "tiargen", "aminoakrikhin", and others. He has also worked methods of biological control of chemico-therapeutic agents which are being used in practice.

Professor S. G. Kolesov worked out a method for preserving biological preparations by drying, which increases the period over which they can be used.

Candidate of Biological Sciences M. A. Babich has worked out a new method of preparing feeding agents by means of meat hydrolysis. The hydrolyzing agents are cheaper than usual meat-peptone media, are standard, and are used by almost all biological factories for manufacturing biological preparations.

This is far from being a complete summary of the new inoculation agents and methods of improvement which the collaborators of the Institute have made available.

The report of Academician T. D. Lysenko, "On the Situation in Biological Science", formed the basis of the resolution of the historic August 1948 meeting of VASKhNIL, which has had a tremendous influence on the work of the Institute. All the scientific collaborators of the Institute are guided in their practical work by these resolutions, which called upon them to obtain a number of concrete results in their search for new inoculation agents.

Professor M. K. Yuskovets together with Candidate of Veterinary Sciences A. I. Kolesova, thanks to the directional method of changing brucellosis cultures, obtained strains with varying virulence and with sharply defined immunogenic properties. One

of these strains proved to be suitable for producing a brucellosis vaccine. The vaccine thus produced has been tested on laboratory animals and at the present time is being tested widely in production. Professor M. K. Yuskovets has also presented an immunization serum for practical use against brucellosis.

Candidate of Chemical Sciences G. A. Garkusha together with Candidate of Veterinary Sciences A. I. Shmulevich synthesized a new "tiargen" preparation, which has proved a very effective agent in combatting piroplasmosis and leptospirosis.

Candidate of Veterinary Sciences A. G. Malyasnnyy is successfully conducting work toward obtaining polyvalent vaccines and serums for use against diseases of young animals, while Professor S. G. Kolesov and Scientific Collaborator Yu. F. Borisovich are having success in obtaining a new vaccine to combat malignant anthrax in sheep and goats. Candidate of Veterinary Sciences Ye. K. Volik, and M. M. Ivanov, together with Biochemist V. A. Plotnikova are doing great work in perfecting methods of culturing microorganisms for the purpose of multiplying them to make vaccines. The results they have obtained make it possible to adapt these methods of producing many vaccines to biologicals factory production.

Interesting work is being done by Candidates of Veterinary Sciences V. N. Syurin, and P. M. Bazylev, under the direction of Stalin Prize Winner N. V. Likhachev, on the directed variability of virus agents of infectious animal diseases, with the aim of using variant strains for producing vaccines.

At the present time a method is being worked on for obtaining weakened strains of fowl smallpox-diphtheria by means of culturing

duck embryos; and a variant strain of the fowl "pseudoplague" virus is also being obtained by adaptation in the organisms of mammals.

During the years of the Institute's existence about 300 scientific projects have been completed, the majority of which have been published in the periodicals devoted to veterinary medicine, medicine, and biology, and in the special publications of the scientific activities of the Institute. The collaborators of the Institute have published two books on the production and control of biological and chemico-therapeutic preparations, as well as a book on the use of biological and chemico-therapeutic preparations. A short manual of laboratory technique has also been published; this has been highly praised by practical laboratory workers, and at the present time a second edition is being prepared. Three monographs have been written on general questions: swine plague; tuberculosis and measures to combat it; and animal necrobacillosis. Several scientific collaborators have participated in the work on a textbook of general epizootology, which was published under the editorship of Academician S. N. Vyshelesskiy.

In twenty years the State Scientific Control Institute has grown and been transformed into a great scientific research establishment, well equipped and supplied, and with highly-skilled scientific cadres.

At the present time there are working in the Institute one active member of the Academy of Sciences, BSSR; four doctors of veterinary sciences who are also professors; 12 candidates of veterinary sciences, and six younger scientific collaborators. Among those working in the Institute are two outstanding veterinary doctors of the RSFSR. Scholarly degrees and invitations have

been received by workers in the Institute. The government has rewarded some of the collaborators with government subsidies for the successful completion of their tasks.

It should be mentioned that F. I. Kagan, Ya. R. Kovalenko, N. V. Likhachov, M. M. Nikiforova, Ye. K. Volik, A. S. Malyavin, G. D. Glukhovtsev, P. M. Bazylev, M. A. Babich, S. G. Kolesov, M. M. Ivanov, and others have worked at the Institute since the first years of its existence.

The institute has donegreat work in preparing cadres of doctors trained in microbiology for the biologicals factories. Special microbiological courses have been conducted for training state controllers. By assigning people to the Institute's laboratories for long periods of time the Institute has succeeded in developing many doctors for the biologicals factories, who are now working as directors, state controllers, chief doctors, and the managers of factories.

For serving many years, and for uninterrupted work, 103 workers of the biologicals industry were given orders and medals in 1950. The Order of Lenin was given to the following older workers: D.A. Shayn, of the Omsk Biologicals Combine; A. I. Dosychev and S. I. Buyglishvili-Gvinchidze, of the Tabakhmel'sk Biologicals Combine; and V. A. Livanov, of the Kashintsev Biologicals Factory.

The Order of the Red Banner of Labor was awarded to the following: the Director of the Kherson Biologicals Factory G. F. Simonov; Director of the Kursk Biologicals Factory D. P. Drobyazgo; State Controller of the Krasnodarsk Biologicals Factory L. F. Popov; State Controller of the Omsk Biologicals Factory G. V. Bryzgunova, and others.

At many biologicals factories the most highly skilled specialists are conducting scientific research work in groups and under the direction of the State Scientific Control Institute, and independently. State Controller of the Alma Ata Biologicals Combine A. A. Pal'gov was awarded the degree of Candidate of Veterinary Sciences for his successful completion of scientific work.

State Controller of the Stavropol' Biological Factory A. I. Nefed'yev is working on obtaining biological preparations for use against sheep paratyphus.

Significant scientific research work is being carried on at the Armavir, Kursk, Omsk, Tobol'sk, and many other biologicals factories.

With new enthusiasm and creative activity all those working at the Institute participated in fulfilling the gradiose program outlined by the government and the party in the Three-Year Plan for the development of animal husbandry. All future scientific and practical work of the Institute has been directed toward developing a radical measures in the fight against the main infectious diseases of animals.

As a result of the great efforts of the Institute new inoculation preparations were made available in 1950, which were accepted by the Veterinary Administration for practical use in 1951. Great attention was also devoted to the production of high quality inoculation agents, and considerable practical aid was extended to the biologicals factories.

The close relationship between the Institute and the biologicals factories, and the direct contact with practical veterinary doctors, has proved to be a solid foundation for new achievements in the production of biological preparations.

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